

TOP SECRET

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NOTES ON "KURIER"
COMMUNICATION SYSTEMTICOM

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Note: These notes on the German high speed communication system were compiled by Ticom Team 6 from information received from Ob. Lt. Poeschke, O-in-C of Kurier Station at Bokel.

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NOTES ON THE "KURIER" COMM. SYSTEM

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This system was developed to combat interception and D/F-ing of U-boat radio transmissions. It was first suggested by Dr. Berndt (Dip. Ing.) of the firm of Telefunken in the Spring of 1943. When the first model was made, Ing. Baurat Vollmeyer (armed Forces Naval official) with an assistant Hauptgefr., Paul Mader, were appointed to represent the Navy - - Above them was Dr. Rindfleisch (his H.Q. were in Hörup Haff).

First trials were sent from Holykirchen to Dannau (near Oldenburg in Holstein) early in 1943. In the summer of 1943 further tests were made from St. Malo to Riga.

The personnel mentioned above were then sent to Berlin to work under Dr. Violet and an improved model was ready early in 1944. Tests between Holykirchen and Bernau followed and in the Summer, the outfit was fitted in a U-boat and further trials were made; these were a failure because the transmitter keying apparatus (called the "Geber") employed a windshield-wiper type motor and this was affected by the temperature and humidity of the U-boat and the repetition rate of the pulses was nearer 270 than the 250 for which the receiver was designed.

The next development was to introduce a synchronous motor for the Geber, working on the 50 cycle supply of the U-boat - - This was not ready until early 1945, when a few U-boats were fitted in Kiel by a man named Berner of N.V.K. who sailed with one of them and performed trials which ended in St. Nazaire where he was probably captured.

By this time the Russians were in Kuestrin and Bernau was evacuated. After a little delay, the receiving apparatus was set up in Bokel (between Neumunster and Rendsburg) and in April (27th) they reported to O.K.M., Flensburg, that they were ready for operations. On 2 May they were ordered to destroy the gear which they did with sledge hammers, burying the remaining mutilated bits at a depth of three meters. This was the only complete receiving apparatus in existence but manufacture in various firms had started and it is possible that the Russians found some parts when they captured Berlin. The transmitter parts were being made in areas occupied by either the British or the Americans - One firm was Weller of Leipzig. A large number of Gebers were destroyed by bombing but thirty were sent to the 5th U-boat Flotilla in Kiel-Wick. None of those parts have been found yet. (Note: Some - - Two, to be exact -- were found after this report was drafted).

U-boats were to carry the transmitting gear only. This consisted of a disc of aluminum having a series of iron slides around the periphery which could be pushed in radially so that they were scanned by a rotating arm carrying a magnetic circuit in which the current changed when passing over a strip. The change of current was amplified and used for modulating the 200 Watt transmitter of the U-boat. The peak power of the transmission was the same as for normal keying. It was possible to pulse the 40 Watt transmitter but this was not done as this set was not sufficiently stable for frequency.

The Geber embodied two switches; the first had four positions, 0, 1, 2, and 3. In position 0 the Geber was switched off and the transmitter could be keyed manually; in position 1 the heaters of the Geber amplifier were switched on and the transmitter could still be keyed. Position 2 was the same as position 1, except that the magnetic arm started revolving. In position 3 the transmitter output tube was biased back so that it could not be keyed except by the Geber. The second switch applied the Geber pulses to the amplifier but transmission did not start until a cam, which was geared down by a ratio of 4:1 to the arm and which had a raised portion for a quarter of its circumference, had operated a pair of contacts.

The length of transmission was limited to one revolution of the disc by the same cam, this time was 436 milli-seconds maximum - employed in the following manner: All pulses were of 2 m.s. with a normal gap of 2 m.s.. There were 25 fixed contacts or strips forming a call-up or triggering portion and lasting 100 m.s., then there was a gap or suppression of 4 pulses lasting 16 m.s., then 304 m.s. for the message which could accommodate 7 of the longest letters after allowing a gap of one pulse between letters of a word or group and two pulses between groups. The last 16 m.s. was blank. Thus the maximum time of transmission was 420 m.s.

The Geber had one other control for adjusting the amplitude of the pulses to suit the particular output valve of the transmitter.

The whole transmitter modification consisted of a box of about five inches cube, containing the amplifier tube, and supporting the disc which was about 25 c.m. in diameter.

The receiving apparatus employed three Philips CR 101 receivers each connected to an aerial and each having a cathode-ray tube of small diameter. The antenna were spaced by about 120 meters and it was claimed that fading was not simultaneous with this spacing. All three receivers were set up to the same frequency by means of a freq. meter Type WIQ.

The low frequency output from each receiver was amplified, passed through a filter, passing 250 c/s (plus/minus 5 c/s), rectified and made to operate an electronic switch. The three electronic switches operated a single multivibrator which applied brightening pulses to the cathode-ray tubes. The multivibrator operated also a Thyatron tube which tripped another relay which lighted a red lamp and simultaneously shut down the three low frequency amplifiers. Once the apparatus had operated no other signal could be received until the Thyatron had been reset; this was not done until the photographic recorder had been reloaded.

At the same time the D.C. output from the A.V.C. diode was amplified and applied to a single pair of deflector plates in the cathode-ray tube. The deflections of the spots on the three tubes was then photographed on a strip of sensitive paper which was clipped to a revolving drum: The joint in the paper was made diagonally so that gap in the signal as recorded by the three traces would not be blurred at the same point on the film. The drum formed a cassette which could be closed and withdrawn in daylight for developing. Originally the film was developed in the cassette but this method was abandoned owing to corrosion of the cassette and a dark room with red light was used. Development took less than five minutes and the signal was then recoded and passed to O.K.M. via radio.

U-boats employed their after antenna for transmission. This had a circular polar diagram near 80 meters and it was not necessary to point the ship at the receiving station; however, between 20 and 30 meters the radiation astern was highly directional and this manoeuvre was probably needed.

The present location of personnel is as follows:-

Dr. Violet - Possibly Berlin.

Dr. Berndt - " "

Dr. Rindfleisch, Vollmeyer, and some other civilians - In a ship which was ordered to sea from Flensburg to go to Neustadt.

Engineer Berner - Possibly a prisoner in St. Nazaire

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Mader - In Neumünster or Bokel.

Ob. Lt. Poeschke, O-in-C Bokel - Bokel

Dr. Jansen, who designed the receiving antennae- Bokelholm

Dr. Meyer, who did some work on the choice of frequencies -
In Pelzahaken (Dr. Meyer said that the receiver Köln
was to be used but this was denied in Bokel).

Another receiving station was proposed in Ulm near Munchen but this was not built because of the rapid advance of the Americans.

A department of O.K.M. called N. Wa. was responsible for deciding the number of outfits to be made and their allocation.

The address of the experimental workshop in Berlin was 30 Kreuzberg Strasse.

It is thought that no receiving apparatus will be found, other than the CR 101 receivers, one Cathode-ray tube, and the photographic paper which has already been collected. It should be possible to find a Geber.

Note: TICOM Team 6 had located Bokel and the O-in-C, Ob. Lt. Poeschke, and had him in custody at Neumünster in preparation to returning him to U.K. when word was recd not to return him. Lt. Rocke of DSD9 was in the field on this particular mission, i.e., "SQUASH" and was informed that we had his man. The above notes were the results of interrogation by Lt. Rocke, with Lt. Luptock, USA, as interpreter, and with Ens. Phillips, USN, present - Held at Neumünster when it was learned that Ob. Lt. Poeschke was not to be sent to U.K. Two Gebers were located at Kiel All "Kurier" apparatus mentioned was taken by Lt. Rocke to U.K....

P. L. Phillips.
Ens. U.S. Navy.